

June 17, 2004

TO: Members of the MAG RASP Technical Advisory Committee

FROM: Harry P. Wolfe, Senior Project Manager

SUBJECT: TRANSMITTAL OF DRAFT TWO OF WORKING PAPER #6, PREFERRED
SCENARIO

On May 13, 2004, the MAG RASP Technical Advisory Committee convened to review the MAG Regional Aviation System Plan Update, Working Paper #6, Preferred Scenario. At the meeting comments were provided and the consultant was asked to make revisions to the working paper in light of the input received. The consultant has reviewed all the comments received and incorporated revisions into a draft two of Working Paper #6. We are transmitting to you this working paper for review. Please provide any comments by the close of the business day, Tuesday, June 29, 2004.

The key changes that were made in the working paper are summarized below:

1. Added the fourth runway at Phoenix Sky Harbor to the Preferred Scenario
2. Eliminated the East-West runway at Williams Gateway Airport from the Preferred Scenario
3. Noted that Wickenburg still supports the development of Forepaugh. However, the airport is not included in the Preferred Scenario
4. Included a list of projects in the Status Quo, Maximize Airport Development and the New Airport alternatives in Appendix C. Identified FY 2003-2007 ADOT Capital Improvement Program which includes Phoenix West Terminal Area and People Mover projects
5. Included precision approach for Chandler to Runway 4R in Preferred Scenario
6. Added section on need for terminal building expansion at Phoenix, Williams Gateway and Scottsdale; Phoenix section indicates that the final configuration of the West Terminal Area will indicate if even more space is needed
7. Added a qualification that the restoration of Memorial Airfield does not necessarily require the runway to be in the same orientation or in the same location
8. Included runway extension of 7R/25L at PHX in the Preferred Scenario
9. Included precision approach to 25R and to the 4th runway (PHX) in the Preferred Scenario

The MAG RASP Technical Advisory Committee is requested to consider recommending this Preferred Scenario to the MAG RASP Policy Committee for further airspace evaluation. If you have any questions or need additional information, please contact me at 602-452-5014.

The primary purpose of conducting a regional or metropolitan aviation system plan, according to current Federal Aviation Administration (FAA) guidelines, is to provide a representation of the “aviation facilities required to meet the immediate and future air transportation needs of the metropolitan area.”¹ These regional aviation plans provide a basis for “definitive and detailed individual airport planning.”

At the outset of the Regional Aviation System Plan Update (MAG RASP), the goals and objectives of the plan were established. The goals include:

1. Meet the long-term air transportation needs of the Region. Air transportation needs include commercial service and general aviation.
2. Capture the air transportation and economic benefits that aviation has to offer, while minimizing any adverse impacts related to congestion, the environment, and airspace.
3. Develop a safe and efficient airport system and maximize the use of the existing system.

Four specific objectives to be achieved by the RASP were also identified. These include:

1. To assess the regional airport system capacity to the year 2025, and identify airport and aviation system capacity deficiencies through the planning period, with special emphasis on commercial aviation demand/capacity issues.
2. To make recommendations for orderly and timely airport facility development which preserves and improves the system of airports to meet present and future air transportation needs of the Region.
3. To assure compatibility of MAG Regional Airport System Planning efforts with FAA and with other regional transportation planning efforts.
4. Provide a basis for coordinating and understanding airport plans with local, regional and state level planning efforts and to provide a basis for public information and aviation support to enhance preservation and promotion of existing key airport facilities.

Through analysis conducted in the five previous working papers, the RASP has provided an overview of the existing system, projected demand for aviation, determined future needs, and evaluated alternatives to meet future needs. This sketch working paper presents the findings and conclusions of the analysis conducted to date, including a preferred future scenario for consideration for the MAG RASP Update. This preferred scenario identifies those projects that have the potential to help the system meet its goals, but will require more detailed airspace review and analysis, including the potential impact to Luke Air Force Base’s mission, in order to determine its implementation feasibility. The purpose of identifying a preferred scenario is to provide information necessary to conduct an airspace review, including potential projects for the airports in the Region so as to provide a means for evaluating the projects together as opposed to separate airspace analysis for each individual project.

¹ FAA Advisory Circular 150/5070-5, “Planning the Metropolitan Airport System”

FINDINGS AND CONCLUSIONS

The most significant finding of the analysis conducted in the RASP is a future aviation capacity deficiency for the entire Region. This deficiency is primarily airside, but the analysis also identified a need for storage facilities (whether hangars or apron tie-downs) for the projected increase in based aircraft in the Phoenix metropolitan area, as well as the need for improved ground access, especially to Phoenix-Sky Harbor International, and airspace capacity. Airside capacity establishes the ability of the existing airfield facilities (runway and taxiway) to accommodate projected aviation activity demand. For purposes of this study, airport capacity was generally measured in terms of annual service volume (ASV), with a limited review of hourly capacity only at Phoenix-Sky Harbor International.

Ten of the MAG system airports are projected to exceed the FAA's planning threshold for capacity enhancements by 2025. Eight of these 10 airports are projected to exceed the FAA's action threshold for additional facilities to be in place to accommodate projected demand.

In addition to capacity, another deficiency that was highlighted was the need for additional instrument approach capabilities in the Phoenix metropolitan area. The volume of aviation activity in the MAG Region, including the high level of training activity, indicates that instrument approach capabilities are vital to the Region's air transportation system. The analysis identified up to nine precision approaches and three nonprecision approaches be developed to serve the MAG Regional aviation system. The issue with adding approach capabilities is primarily the availability of airspace and the ability of the existing airspace to accommodate this type of activity. Accommodating increased and more precise instrument approaches was also noted to be of concern to Luke Air Force Base and its ability to maintain the current level of airspace required for the Base to fulfill its mission. The analysis contained in the RASP only highlights some of the airspace issues but does not include a detailed airspace modeling component, nor does it measure the capacity of the Region's airspace.

With the major deficiencies identified, the next step was to determine alternative means for improving the system and to select evaluation criteria. Four alternatives were selected for analysis including:

- ❑ Status Quo
- ❑ Improved Technology
- ❑ Maximized Development of Existing System
- ❑ New Airport Development (general aviation and/or commercial service)

The Status Quo serves as the baseline against which other alternatives are compared in terms of the impact to the various criteria from development proposed as part of the four alternatives. While four separate alternatives were analyzed in this study, some of these alternatives can be viewed as more additive than completely separate alternatives. For example, all projects included in the Status Quo alternative are also part of the three remaining alternatives. It is also anticipated that the Improved Technology alternative would be implemented as part of the Maximized Airport Development and New Airport Development alternatives, with the purpose of the Improved Technology alternative being to evaluate whether these enhancements could alone resolve the Region's identified capacity shortfall. The Maximized Airport Development and New Airport Development alternatives are more stand-alone options evaluated to determine the ability of the existing Regional system to be enhanced to address the capacity deficiencies.

Ten criteria were selected for evaluation to enable the comparison of the four alternatives. These criteria include:

- ❑ Environmental (noise and air quality)
- ❑ Costs/Economic Benefits
- ❑ Delay
- ❑ User convenience
- ❑ Access improvements
- ❑ Impact on Luke AFB Airspace
- ❑ Impact on Regional Airspace
- ❑ Ease of implementation
- ❑ Title VI
- ❑ FAA/ADOT design compliance

While each of these criterion are important to the determination of the ability of the alternatives to be implemented, airspace compatibility, including the impact to Luke Air Force Base, was determined to be one of the most significant issues. Protection of Luke's mission through airspace preservation, land use compatibility, and consideration of its needs was identified as a high priority evaluation criterion.

Each of the four alternatives was evaluated using these criteria to an airport-specific level of detail. For purposes of the alternatives evaluation, specific sites were located for new projects at existing airports, as well as locations for proposed new airports to enable a similar level of analysis in evaluating the alternatives. A summary of the general findings related to the ability of each alternative to meet the three goals of the study is provided below.

Ability to Meet Study's Goals

The purpose of any regional or metropolitan aviation system plan is to determine what the aviation needs of the area are and to develop a plan to meet the needs. The MAG RASP Update defined long-term as the horizon year 2025, more than a 20-year planning period. Over the past 20 years, the Phoenix metropolitan area has experienced tremendous growth in population, requiring proportional growth in its aviation system. While growth is projected to decline in terms of percentage rates, significant population growth is still projected to continue through 2025. In 2000, the population of Maricopa County was approximately 3.1 million persons. By 2025, the population is projected to reach nearly 5.7 million persons. Similarly, growth in the demand for the aviation system is also projected to continue. The RASP's analysis evaluated the ability of four alternatives to meet the long-term air transportation needs.

Status Quo

The Status Quo alternative serves as the RASP's "do-nothing" or baseline alternative. This alternative scenario represents construction of only those development projects identified in the Arizona Department of Transportation Aeronautics Division's (ADOT's) FY 2003-2007 Capital Improvement Program (CIP). No additional facility development is identified in this alternative scenario, other than that required to maintain all existing and currently programmed facilities. Of these projects, the runway extension at Glendale has been completed during the course of this study.

The Status Quo alternative does the least of the four alternatives to improve the Region's capacity deficiency, with no additional capacity enhancements included in this alternative. Of the 10 criteria evaluated in the alternatives evaluation, the Status Quo will have the most significant negative impact on delay, which results in costs to users including airlines, general aviation businesses, passengers, and pilots. The delay projected for 2025 based on previous analyses is estimated to cost between \$643 million (Scenario 1-low growth at Phoenix-Sky Harbor International) and \$1.5 billion (Scenario 2-high growth at Phoenix-Sky Harbor International). In addition to calculated costs, there are additional costs

that cannot easily be quantified, but will impact the Region including potential loss of flight training, reduced airline service, and business opportunities.

The negative impact to delay is somewhat offset by the cost of the Status Quo alternative, which is considered to be \$0, as the projects included in this alternative are considered to be completed as part of this alternative (they are already programmed as part of the FY 2003-2007 ADOT CIP). The actual cost of the projects included in the alternative is \$919 million for the period FY 2003-2007. Without additional spending on projects, however, the economic benefit of the Region's aviation system will be limited, when typically the economic benefit of airports continues to grow each year with spending on construction projects in addition to the traditional spending that occurs at an airport.

Analysis of other criteria such as noise, air quality, user convenience, access improvements, airspace compatibility, ease of implementation, and Title VI impacts showed that the Status Quo alternative has the least negative affect on the Region of the four alternatives evaluated, although the impacts of some of these are not significantly less than the impact of other action-oriented alternatives. The study's analysis assumed that the same level of demand would be generated and accommodated under all four alternatives such that the impacts that result would be due to constructing new facilities that are needed to accommodate demand.

The Status Quo alternative does not meet the long-term air transportation needs of the Region. The air transportation needs will be impacted by the inability of the Regional system to accommodate the projected level of demand without significant delay to users. The rippling effect of delay including costs to users and potential loss of economic benefits and other less-quantifiable benefits indicate that some action-oriented alternative is necessary for the Region to serve the projected levels of aviation demand for 2025.

Without meeting the long-term needs, the Status Quo alternative does not allow the Region to capture additional economic benefits that aviation has to offer. Economic benefits are likely to continue to grow as the system accommodates more activity, but as the delay increases, these benefits will be stymied and costs will be incurred to users of the system. While the existing system is safe, safety is not improved by limiting capacity, including a lack of precision instrument capabilities that allow users more defined approach paths to airports. The existing system would be maximized as part of the Status Quo alternative to the point of over-saturation as new facilities are not constructed to accommodate the projected increases in demand. By limiting the development of new facilities, demand will not necessarily be reduced, although that potential exists, but will instead be forced to incur the costs of delay including more time spent in the air trying to land and on the ground waiting to take off. These impacts relate to congestion, the environment, and airspace, which are negatively impacted through the Status Quo alternative.

Improved Technology

The Improved Technology alternative was developed to determine if the anticipated technology enhancements underway or in the planning stages would have the ability to significantly increase capacity such that construction-related projects would not be needed to provide for the projected level of aviation activity in the Region in 2025. The FAA has been continuously evaluating new technologies related to airspace and flight. The FAA's Operational Evolution Plan, as well as the Airspace Capacity Enhancement Plan, provides discussion of initiatives that are proposed to address increasing airspace and airport capacity. Potential improvements and methodologies include:

- ❑ Flight management systems (FMS) transition to existing approaches – FMS approaches
- ❑ Independent parallel approaches using precision runway monitor (PRM) – including closely spaced parallel runways
- ❑ Independent parallel approaches using final monitor aid (FMA)
- ❑ Improved operations on parallel runways separated by less than 2,500 feet
- ❑ Simultaneous offset instrument approach – for parallel runways spaced 750 to 3,000 feet apart
- ❑ Along track separation – reduced diagonal separation of aircraft
- ❑ Automated dependent surveillance (ADS-B)/cockpit display of traffic information (CDTI) – allows for greater awareness of traffic by pilots
- ❑ Global Positioning System (GPS) augmentations – wide area augmentation system (WAAS) and local area augmentation system (LAAS)
- ❑ Area navigation (RNAV and LNAV) approaches – don't require ground-based NAVAIDs

In addition, the FAA plans to implement two ASR-11s to enhance radar coverage in the Region. These new ASR-11s should enhance the Region's airspace and are included in this alternative. It has been noted that if the two new ASR-11s are implemented, it is possible that the ASR-8 at Williams Gateway may not be needed. This land could then be used for terminal development at Williams Gateway if it is determined that additional terminal space is required.

The analysis has shown that, overall, it is anticipated that implementation of the new technologies has the potential to increase capacity by approximately 4 percent for the entire Region.² The enhanced capacity is likely to be realized at the larger airports such as Phoenix-Sky Harbor International, but the impact could be realized at other airports depending upon the final airspace requirements set by the FAA once the technologies are in place and their implementation by air traffic control. Enhancements such as curved precision approaches and radar coverage have the potential to impact many airports, including potentially improving the airspace compatibility in the Region with airspace requirements related to approach procedures changing. The impact of these and other planned improvements to the national airspace system can be evaluated in terms of the projected impact on capacity and delay, but do not easily lend to evaluation of their impact on other criteria such as noise and airspace compatibility.

It is likely that the Improved Technology alternative will be implemented as a result of the FAA's responsibility for airspace, including enhancements that will improve airspace capacity and compatibility. The RASP's analysis has indicated, however, that even with implementation of new and improved technologies, that capacity will still be insufficient to accommodate projected aviation demand for the Phoenix metropolitan Region through 2025. The Improved Technology alternative does provide for maximizing the existing system by increasing the capacity in the Region without building additional facilities, but does not sufficiently increase the capacity to allow for significantly reduced delay. Therefore, construction-related alternatives are needed in addition to implementing the Improved Technology alternative if the study's goals of meeting long-range transportation needs and capturing additional economic benefits are to be met. The congestion, environmental, and airspace impacts of the Improved Technology alternative are not known. The impact of these and other planned improvements to the national airspace system can be evaluated in terms of the projected impact on capacity and delay, but do not easily lend to evaluation of their impact on other criteria such as noise and airspace compatibility.

² In addition to these technologies, it has been noted that improvements to en-route airspace could also enhance capacity in the Region. No accurate data source has been identified which quantifies the capacity enhancement from changes to en-route traffic.

Maximized Airport Development

The Maximized Airport Development alternative examined the ability of each airport to implement capacity enhancements, as well as other projects, to achieve a Region-wide increase in overall capacity using the existing airports. Under the Maximized Airport Development alternative, new or reconstructed runways were proposed at six airports, longer runways were proposed at four airports, precision approaches were proposed at nine additional airports, nonprecision approaches were proposed at four additional airports, and additional commercial terminal facilities were proposed at three airports. Analysis of the impacts of these proposed developments was conducted on an airport-specific level, by criterion. This type of analysis allowed for a detailed examination of each proposed project to determine which projects should be carried forward for recommendation based on its anticipated impacts to the 10 criteria.

If all of the projects proposed as part of the Maximized Airport Development alternative were implemented, the Region's capacity would be enhanced in 2025 by 17 to 20 percent. In addition, other needs, specifically storage facilities and approach capabilities, would also be improved allowing the system to meet many of the long-term air transportation needs. While implementation of all of the projects included in the alternative would improve the capacity and help to meet the air transportation needs of the Region, other impacts were also considered that indicate that some of the projects have potential negative impacts that may outweigh the positive returns that could be achieved.

It is recognized that the airports in the MAG Region, while operated independently by different governing bodies and located in different locales, do operate in the same environment to serve the entire Region's aviation needs. Whether the needs are commercial air travel, corporate general aviation, or recreational, each airport serves a distinct role in the Regional system and contributes to the ability of the overall network to meet the long-term air transportation needs. With Phoenix-Sky Harbor International, Williams Gateway, and Scottsdale serving commercial passengers, and the remaining airports primarily serving general aviation activity ranging from corporate to recreational, each airport's role must be considered independently. Although they serve different functions, they do comprise an interlocking system.

For the commercial needs, the study's analysis has shown that, under the Maximized Airport Development alternative, commercial airline service is likely to continue to be most prevalent at Phoenix-Sky Harbor International, supplemented by Williams Gateway and Scottsdale, to a lesser extent. Development of a fourth runway at Phoenix-Sky Harbor International was evaluated in the Maximized Airport Development alternative, as was development of a new east-west runway at Williams Gateway. The fourth runway at Phoenix-Sky Harbor International was noted to have significant impacts, including requiring relocation of a major business (Allied Signal/Honeywell) on the airport. Other significant impacts included noise, cost, airspace compatibility and ease of implementation. Even with this anticipated level of impact related to development of a fourth runway, this study has concluded that this project should be included for further airspace evaluation. It is important to recognize the role that Phoenix-Sky Harbor International plays in the existing system serving the majority of commercial airline needs. With development of the West Terminal Area, as included in the Status Quo alternative due to its programming in the FY 2003-2007 ADOT CIP, and the People Mover system, the ability of passengers to reach the airport will be increased. Development of a fourth runway would complement this growth and should be studied further to determine the range of potential impacts that may result.

Development of an east-west runway at Williams Gateway presents another potential opportunity for increase in capacity in the Region, especially as it relates to commercial service activity. The General Motors facility relocation may present an opportunity for this runway's development. While development of an east-west runway would have impacts to noise and cost, it is anticipated that airspace compatibility

would not be as significant for Phoenix-Sky Harbor International since a new east-west runway at Williams Gateway would actually put traffic flows in line with existing Phoenix-Sky Harbor activity. A negative impact could result to Luke for Special Use Airspace during bad weather conditions and under all weather conditions, Chandler Municipal could also be negatively impacted. Ease of implementation was also noted to be a potential issue due to the significant efforts required to construct a new runway and additional terminal facilities at commercial airports across the U.S. Concerns regarding noise and the environment have been noted, as development surrounding Williams Gateway continues in communities such as Gilbert and Queen Creek. While an east-west runway could provide additional capacity to the Region, the actual capacity of Williams Gateway itself would be impacted since the existing three parallel runways are oriented northwest to southeast and under certain conditions the capacity could actually be reduced depending upon the actual operation of the east-west runway. It was noted that a capacity increase at Williams Gateway could possibly be attained through development of curved instrument approaches to the existing three runways or other advancements in technology, therefore limiting the potential impact with Phoenix-Sky Harbor's air traffic. Therefore, the east-west runway at Williams Gateway is not included in the preferred scenario for further analysis of the airspace impacts.

For increasing capacity and improving the Region's accommodation of general aviation activity to meet the long-term air transportation needs, some of the most significant projects included in the Maximized Airport Development alternative included development of new runways, restoration of runways, runway extensions, and implementation of precision approaches. New runways at Phoenix-Deer Valley and Phoenix-Goodyear were evaluated as part of the Maximized Airport Development alternative. The new runway at Phoenix-Deer Valley was noted to have impacts to noise, cost, airspace compatibility, and ease of implementation. Significant increases in the number of acres that would be impacted by noise, including incompatible land uses, and the fact that the runway has not been included in previous planning efforts for the airport were noted to impact the ability of the project to be implemented. The parallel runway at Phoenix-Goodyear was noted to have a greater potential for implementation as it has been included in previous planning efforts, and would have a significantly lower cost. The most significant issue with a parallel runway at Phoenix-Goodyear is a potential moderate to severe impact on Luke's airspace. If the runway did not have a precision approach, the impact would not be as severe.

Restoration or paving of runways at Memorial and Pleasant Valley were also evaluated as part of the RASP's Maximized Airport Development alternative. The most significant issue with restoration of a runway at Memorial is ease of implementation since restoration has been pursued but not completed in the past. Recently additional interest has been noted for restoration, therefore the potential for this project may exist. However, restoration does not indicate that the runway facilities be located in the same orientation as the existing runways. It may be possible to develop a runway at Memorial or in the vicinity of the existing Memorial Airport that would limit some of the potential impacts that have been identified. While paving of a runway at Pleasant Valley was analyzed as part of the RASP's analysis, subsequent to the development of the alternatives the Arizona State Land Department, the landowner of the property on which Pleasant Valley is located, indicated that they are not interested in development of new facilities at the airport site. Therefore, this project will not be included in the preferred scenario, but restoration of a runway or development of a new runway at Memorial is included.

Runway extensions in the Maximized Airport Development alternative were analyzed for Buckeye Municipal, Chandler Municipal, and Phoenix-Sky Harbor International. For Buckeye, the longer runway is not anticipated to result in negative impacts by itself, but combination of a longer runway and a more precise approach were noted to have the potential to impact Luke's activities as more sophisticated aircraft would likely use the airport and create compatibility issues. This same issue was noted for a precision approach at Chandler, which could also impact airspace compatibility with Phoenix-Sky Harbor International if it were to Runway 22L. It has been noted that a precision approach to Runway 4R, especially if it were a curved precision approach, may not have the same compatibility issues. A runway

extension at Phoenix-Sky Harbor was not noted, by itself, to have significant impacts although a detailed study would be required to determine the extent of the impacts resulting from extending Runway 7R/25L.

Development of more precise approaches was recommended for many of the Region's airports including three nonprecision approaches and nine precision approaches as part of the Maximized Airport Development alternative. Nonprecision approaches were recommended at the smaller airports, while precision approaches were recommended at the designated reliever and commercial airports in the Region. Provision of precise approaches is highly recommended for reliever and commercial airports for those airports to adequately fulfill their roles. While both Phoenix-Sky Harbor International and Williams Gateway have existing precision approaches, none of the other airports in the Region, including the reliever airports, have this capability. The most significant issue related to development of more precise approaches is airspace compatibility, which was analyzed as it relates to potential impacts to Phoenix-Sky Harbor International and Luke Air Force Base. Impacts were identified for all of the approach improvements, with the least significant impacts associated with Mesa Falcon Field, Scottsdale, and Williams Gateway. If curved precision approaches, as proposed as part of the Improved Technology alternative, were developed from the east at Phoenix-Deer Valley, from the east at Phoenix-Goodyear, and from the southwest at Chandler, the impacts would not be as significant, but would still exist related to Phoenix-Sky Harbor International and Luke. It is important to note that while more precise approaches have been recommended, that with improvements in technology, it is assumed that curved approaches may present less impact to the Region's airspace and will be implemented, as possible.

Terminal facility development to serve commercial passengers was recommended as part of the Maximized Airport Development alternative for Phoenix-Sky Harbor International, Scottsdale, and Williams Gateway. It is important to note that development of the West Terminal Area at Phoenix-Sky Harbor International is included as part of the Status Quo alternative since it has been included in the FY 2003-2007 ADOT CIP. Depending on the final configuration of this area, additional terminal facilities at Phoenix-Sky Harbor International may or may not be warranted to meet demand projected as part of the RASP.

The following projects were noted to have the most potential for development as part of the Maximized Airport Development alternative and are included in the preferred scenario:

- ❑ Buckeye Municipal – runway extension
- ❑ Chandler Municipal – runway extension, precision approach
- ❑ Glendale Municipal – taxiway extension
- ❑ Memorial – airport facility restoration
- ❑ Mesa Falcon Field – precision approach
- ❑ Phoenix-Deer Valley – parallel runway and precision approach from the east
- ❑ Phoenix-Goodyear – parallel runway and precision approach from the east
- ❑ Phoenix-Sky Harbor International – 4th runway, runway extension, precision approaches (4th runway and 25R), additional terminal building space
- ❑ Scottsdale – precision approach, additional terminal building space
- ❑ Williams Gateway – additional terminal building space³

These projects would enhance the Region's ability to meet long-term air transportation needs by improving the capacity of the airport system and providing additional facilities and approaches. While improving the capacity of the system, even with these enhancements, further capacity increases could be needed to meet the projected level of demand for 2025.

³ The development of curved instrument approaches at Williams Gateway is also included in the Preferred Scenario.

In addition to enhancing the Region's ability to meet long-term air transportation needs, implementation of these projects would allow the Region to capture additional economic benefits that aviation has to offer. Economic benefits result not only from construction-related impacts from building new runways and storage facilities, but also result from the increased activity that is accommodated at the airports. Increased usage by transient operators, especially those conducting business in the Region, increases the economic benefits as these operators spend money in the Regional economy. This spending ripples through the Region, resulting in increased employment at the airports and beyond including retail, food and beverage, and lodging. With Arizona's high level of tourist activity, accommodation of aviation demand is important to growth in this industry that is promoted by increasing the ability of tourists to arrive in the Region via air travel.

The Maximized Airport Development alternative also meets the study's goal for maximizing the use of the existing system without development of new airport sites to develop a safe and efficient Regional system. The key to this alternative is to minimize potential adverse impacts related to congestion, the environment and airspace. The projects identified previously in this section consider these impacts, and while requiring additional study and implementation of improved technology such as curved approaches, appear to offer needed enhancements while limiting the most significant impacts. The projects identified in this section as part of the Maximized Airport Development alternative, along with those from the Status Quo and Improved Technology alternatives, comprise the preferred scenario and would be included in a future detailed airspace analysis.

New Airport Development

The New Airport Development alternative assumed that the Status Quo and Improved Technology alternatives were implemented, but analyzed the ability of the Region's long-term air transportation needs to be met with development of new airport facilities versus expanding the existing airports as evaluated in the Maximized Airport Development alternative. Four new general aviation airports and three commercial airports were analyzed, with the focus of determining if one new general aviation airport and one of the commercial sites were feasible.

One of the sites evaluated in the New Airport Development alternative was analyzed, but determined to be infeasible (New Peoria). The New Peoria site has been studied extensively, but as noted under the Maximized Airport Development alternative, this site is located on the existing Pleasant Valley site and the Arizona State Land Department has indicated that, as the owner, they would not support development of new facilities on the site.

Of the remaining new sites, three were evaluated for a general aviation airport, two were evaluated for a commercial airport, and further development of Williams Gateway as a supplemental commercial facility was evaluated. Forepaugh is being considered as a potential replacement for Wickenburg Municipal, and the City of Wickenburg has included this airport in its future planning processes. It is important to note, however, that Luke has identified a moderate to severe impact to its mission from development of an improved airport at Forepaugh. Most aircraft departing Forepaugh would have to transit the Gladden/Bagdad MOA, interfering with Luke's ability to use the MOA in its training missions.

The two new general aviation sites, New East Valley and New South Valley both were rated as having moderate potential for development. The New East Valley site is located near the Tonto National Forest and existing Indian communities. The New South Valley site is located in Pinal County and would likely be contained within the Gila River Indian Community. Both sites have the potential for impact to Luke's mission as it relates to low-level training routes and Special Use Airspace. It was noted that a New South Valley site that was located on the west side of Interstate 10 would reduce the potential for impact to Luke. These two new sites appear to have merit for further consideration and feasibility analysis. The

two new airports would need a public sponsor identified that is willing to undertake the analysis and development.

In terms of commercial airport sites, the New North Commercial and New RAFA Commercial sites were rated as low probability for development. The New North Commercial site was previously studied on a cursory level and determined to have significant issues related to airspace compatibility with Luke and topographical-limiting constraints. The New RAFA Commercial site, studied in 1993, and identified in the RASP as the Casa Grande site, also has significant issues including lack of a owner/sponsor, requirements for extensive coordination with existing commercial airports (Phoenix-Sky Harbor International and Tucson International), potential airspace constraints depending on its final location, and distance from the primary area the airport is intended to serve, the Phoenix metropolitan Region.

The supplemental Williams Commercial site was identified as having the greatest potential for implementation as the airport has increasingly been serving commercial demand in the metropolitan area. The most significant issue is how to operate a dual-commercial service airport system while the existing airport (Phoenix-Sky Harbor International) continues to have capacity and the airlines are currently operating at the facility. This “new airport” alternative does address the Region’s long-term air transportation needs as it provides an existing site for growth and development of commercial airline activities. It has been noted that development of curved instrument approaches to the existing runways may allow for better air traffic coordination between Williams Gateway and Phoenix-Sky Harbor International and would enhance the capacity of the airport without development of an east-west runway.

Development of a new general aviation airport is recommended for further analysis as this cursory review has shown two potential areas where the impacts are considered moderate. The New East Valley and New South Valley sites present opportunities where the Region’s capacity could be increased through development of new runway facilities at either site. This would help to fulfill the study’s goal of meeting the long-term air transportation needs, however the extent of the impact to congestion, the environment, and airspace are not sufficiently detailed.

The analysis has shown, both in the Maximized Airport Development alternative and the New Airport Development alternative that a supplemental Williams Gateway commercial airport has significant potential to address several of this study’s goals. This New Airport Development alternative for commercial activity appears to have the highest potential for implementation.

Summary of Preferred Scenario

Evaluation of the four alternatives in the RASP indicates that all or part of the four alternatives is preferred in order for the Regional system to meet its goals. Therefore, the study’s preferred scenario for future consideration is a hybrid, comprised of various elements from the four alternatives that appear to meet the study’s goals but also were not identified as having significant negative impacts. The study’s preferred scenario can be summarized as follows:

- ❑ The Status Quo alternative, while serving as a baseline for comparison, also included several projects that are underway or have been completed (Glendale runway extension). The West Terminal Area and People Mover at Phoenix-Sky Harbor International have also been included based on their inclusion in the FY 2003-2007 ADOT CIP. These projects are included in the preferred scenario.
- ❑ The Improved Technology alternative’s projects are also included in the preferred scenario. Development of more sophisticated flight and approach procedures, which do not necessarily require ground-based changes, will enhance the Phoenix metropolitan aviation system while resulting in limited negative impacts. The most important of these improvements is the development of curved approaches into the airports.

- ❑ The Maximized Airport Development alternative included numerous action-oriented projects. Based on the analysis of the alternative and the potential impacts, runway extensions are recommended for Buckeye Municipal, Chandler Municipal, and Phoenix-Sky Harbor International. Runway restoration is recommended for Memorial, while a taxiway extension is recommended for Glendale Municipal. New runways are recommended for Phoenix-Deer Valley, Phoenix-Goodyear, and Phoenix-Sky Harbor International. Curved precision approaches are included in the preferred scenario for Chandler, Mesa Falcon Field, Phoenix-Deer Valley, Phoenix-Goodyear, Scottsdale, and Williams Gateway. Additional precision approaches to Phoenix-Sky Harbor International's Runway 25R and to both ends of the fourth runway are also included in the preferred scenario.
- ❑ The New Airport Development alternative analyzed potential development of a new general aviation and a new or supplemental commercial service airport. Development of a new general aviation airport is included in the preferred scenario for further analysis, including a feasibility study, as well as continuation of Williams Gateway as a supplemental commercial airport for the Phoenix Region.

Development of this preferred scenario will enhance the Region's operational capacity, provide for a more efficient and safe aviation environment, and maximize the existing facilities and services that are currently available in the metropolitan area. Implementation of the preferred scenario will require further study and consideration, including detailed airport-specific analysis.

Policy Considerations

The RASP has undertaken significant analysis of airport-specific projects and their potential impacts. The analysis has shown that additional study will be needed prior to further consideration, but that there are also policy considerations. The RASP provides an overview of the needs from a Regional perspective, but all projects must be initiated by sponsors who have jurisdiction over their airports.

The following are policy considerations that have been identified in the evaluation of recommendations for the MAG RASP:

- ❑ **Airspace enhancements:** The RASP has included development of additional runways and improved instrument approach capabilities that will enhance the ability of the system to accommodate future demand in the preferred scenario. All of these changes will dictate analysis of airspace requirements, including how to integrate these improvements into the existing airspace structure. Significant analysis of potential impacts to Luke's existing airspace needs and Phoenix-Sky Harbor International was conducted, however, a systemwide analysis of how implementing all of these projects would impact the airspace was not prepared. In addition, it is assumed that as technology improvements are made that the impact may be reduced, but is not known at this time. While a single project can be accommodated within the existing airspace environs based on current technology, when combined, the total impact of the recommendations will require more detailed analysis, including computer-aided airspace modeling wherein these improvements are analyzed together as a "single improvement" versus as individual projects. Airspace modeling may also afford the opportunity to examine how the new technological advances related to approach procedures may impact the airspace requirements.
- ❑ **Environmental impacts:** The RASP primarily evaluated noise impacts as a result of the alternatives. The noise impact analysis was based on existing available noise contours, supplementing these contours with development of estimated noise impact areas where identified. Prior to implementation of projects, additional environmental review would be required, including noise and other environmental categories such as air quality.
- ❑ **Land use:** As part of the noise evaluation in the alternatives analysis, the impacts to incompatible land uses near airports were identified. This cursory analysis also reviewed the State's policies regarding airport land use compatibility. Arizona has several statutes in place that were developed to

reflect the importance of addressing airport noise including Airport Influence Area, Military Airport Registry, Military Airport Disclosure and Public Airport Disclosure. Many of the airports have implemented Public Airport Disclosure and Luke has complied with Military Airport Registry and Disclosure, but none of the MAG airports have implemented Airport Influence Area which serves as a notification that properties that are located in the vicinity of an airport may be impacted by noise levels of aircraft overflights. Consideration of this statute and its ability to impact future airport development should be part of follow-on planning efforts for the MAG airports. In addition to noise issues, the location of other incompatible uses, such as the gas storage facility that was planned near Luke Air Force Base, should also be considered for the long-term preservation of the Region's airport system. The land uses and zoning around airports should consider the need for potential airport expansion to accommodate growth projected for airports in the Region. As part of a feasibility study for a new airport, land uses would be a significant evaluation factor in determining the viability of constructing a new general aviation airport in the Region.

Appendix C

Status Quo Alternative (Project List)

Buckeye Municipal

- Conduct environmental studies for Runway 17 extension
- Runway and taxiway extension/widening/strengthening
- Install REILs

Chandler Municipal

- Apron structural upgrade
- Construct aprons (north, south, Ryan Rd.)
- Aviation easement, Runway 4L
- Heliport construction
- Conduct environmental studies for new apron (south side)
- Taxiway H extension
- Signage for Taxiway A and Runway 4L/22R
- ATCT voice recorder and playback unit
- Land acquisition (future development north of 22L approach)
- Taxiway B extension
- Pavement preservation (apron, runway, taxiway)
- Access roads to south side
- Design and construct airport operations and maintenance building
- Taxiway A extension/widening/strengthening

Estrella Sailport

- No projects

Gila Bend Municipal

- RPZ land acquisition (11.7 acres)
- RPZ land acquisition (3.5 acres)
- RPZ obstruction removal (fence)
- Install REILs, PAPIs, apron lighting
- Access road parking
- Terminal building
- Install fencing

Glendale Municipal

- Runway extension
- Conduct drainage study for east side development
- Apron design and construction
- East side taxiway design and construction
- Construct east side access road
- Pavement preservation (apron, runway, taxiway)
- Install east side utilities

Memorial

- No projects

Appendix C

Status Quo Alternative (Project List)

Mesa Falcon Field

- Pave runway and taxiway shoulders in safety area
- Falcon Drive access to terminal
- Pavement marking installation
- Pavement reconstruction Taxiway B-8, apron area, Phase I
- Install perimeter fencing
- Pavement preservation (Runways 4R and 4L)
- Pavement preservation (All taxiways, apron areas)
- Construct Falcon Field underpass
- Master Plan/Part 150 study
- Construct apron
- Land acquisition
- Taxilane construction
- Taxiway grade, drain and surface (hi-speed exits)
- Construct general aviation terminal
- Construct auto parking
- Runway, taxiway overlays
- Heliport, apron reconstruction
- Install perimeter fencing

Phoenix – Deer Valley

- Land acquisition (prorated portion from 1985)
- Apron reconstruction
- Pavement preservation (runway, taxiway, apron)

Phoenix – Goodyear

- Reconstruct Taxiway A
- T-hangar and ramp construction
- Pavement preservation (taxiway and apron)

Phoenix – Sky Harbor International

- Security improvements (Part 107 and other)
- Reconstruct Runway 7L/25 R in concrete
- Rehabilitate Taxiways D & E
- Construct 2 ARFF stations 19 & 29
- New electric vault, south
- EIS for proposed west terminal
- Voluntary land acquisition, residential parcels
- Noise mitigation for residences 65-69 DNL
- Continuation of WALA project
- Improvements ADA compliant directives
- T-4 tenant space additions, add two gates
- Realign Sky Harbor Boulevard
- Design and construct people mover
- Construct Taxiway U
- West terminal infrastructure
- Land acquisition (airport protection)

Appendix C

Status Quo Alternative (Project List)

Pleasant Valley

No projects

Scottsdale

- Reconstruct apron (K)
- Fencing, gates, cameras and motion sensors
- Reconstruct Corporate Jets apron
- Apron pavement preservation (Delta, CJAC and terminal)
- Land acquisition for development (9.5 acres)
- Safety area improvements
- Perimeter road construction, Phase I
- Update Part 150 and Master Plan
- Apron reconstruction design
- Apron construction design
- Runway safety area construction design
- Taxiway A extension design
- Perimeter road design, Phase II
- Design airside utilities installation
- Taxiway overlays
- Apron reconstruct (Executive Air Service)
- Apron construct (Keekor)
- RSA improvement
- Extend Taxiway A (2000' X 40')
- Construct transient apron
- Baggage screening
- Install utilities
- Maintenance building
- Auto parking design and construction
- Pavement preservation (apron)
- Airport security

Sky Ranch Carefree

No projects

Stellar Airpark

No projects

Wickenburg Municipal

- Runway extension/widening/strengthening
- Waterline extension for fire protection
- Overlay apron
- Crack seal and slurry taxiway
- Pavement preservation (runway, taxiway, apron)
- Construct aprons

Appendix C

Status Quo Alternative (Project List)

Williams Gateway

- Design/construct north tract connector taxiway
- Design/reconstruct taxiway L from 30L to south tract
- Expand existing cargo apron, Phase II
- Extend access road from Sossaman Road to cargo apron
- Electronic fingerprinting equipment, card access readers
- Purchase land easements (84 acres)
- Apron construction
- Preliminary engineering and site design for eastside terminal
- Pedestrian and vehicle gates leading to AOA, parking lots, and ATCT
- Construct south tract access roads
- Construct taxiways N, P, A
- Purchase ARFF truck
- Install ILS on Runway 30R
- Blast fence
- Taxiway construction, reconstruction
- Relocate ASR

Sources: Arizona Department of Transportation Aeronautics Division Five-Year Airport Development Program FY 2003-2007

Appendix C
Maximized Airport Development Alternative (2025 Costs)

						Scenario 1	Scenario 2
Airport	Length	Width	Area	Unit	Unit Price	Total	Total
Buckeye Municipal							
Runway extension	1,800	100	20,000	SY	\$30	\$600,000	
Runway widening/strengthening	5,500	25	15,278	SY	\$40	\$611,100	
Parallel taxiway extension	3,400	35	13,222	SY	\$30	\$396,700	
MITL/HITL	3,400	NA	NA	LF	\$35	\$119,000	
Precision approach capability - MALS	FAA			LS			
MIRL/HIRL	7,300			LF	\$40	\$292,000	
Aircraft storage expansion	NA	NA	77	EA	\$30,000	\$2,772,000	
Subtotal						\$4,790,800	
Engineering & Contingency 20%						\$958,200	
Total						\$5,749,000	
Chandler Municipal							
Runway extension	1,950	100	21,667	SY	\$30	\$650,000	
Runway widening and strengthening	6,800	25	18,889	SY	\$40	\$755,600	
MIRL/HIRL	1,950			LF	\$40	\$78,000	
Parallel taxiway extensions	2,550	35	9,917	SY	\$30	\$297,500	
MITL/HITL	2,550			LF	\$35	\$89,300	
Precision approach capability - MALS	FAA			LS			
Aircraft storage expansion	NA	NA	415	EA	\$30,000	\$14,940,000	
Subtotal						\$16,810,400	
Engineering & Contingency 20%						\$3,362,100	
Total						\$20,172,500	

Appendix C
Maximized Airport Development Alternative (2025 Costs)

Airport	Length	Width	Area	Unit	Unit Price	Scenario 1 Total	Scenario 2 Total
Estrella Sailport							
Visual aids - PAPI			2	EA	\$37,500	\$75,000	
Visual aids - REIL			2	EA	\$20,000	\$40,000	
Subtotal						\$115,000	
Engineering & Contingency 20%						\$23,000	
Total						\$138,000	
Gila Bend Municipal							
Increased pavement strength	5,200	75	43,333	SY	\$15	\$650,000	
Parallel taxiway extension	3,500	75	29,167	SY	\$30	\$105,000	
MITL	3,500			LF	\$30	\$105,000	
Improved approach capability - PAPI			2	EA	\$37,500	\$75,000	
Improved approach capability - REIL			2	EA	\$20,000	\$40,000	
Subtotal						\$975,000	
Engineering & Contingency 20%						\$195,000	
Total							\$1,170,000
Glendale Municipal							
Parallel taxiway (east side)	7,500	35	29,167	SY	\$30	\$225,000	
Parallel taxiway extension (west side)	2,040	35	7,933	SY	\$30	\$61,200	
Precision approach capability - MALS	FAA			LS			
MIRL/HIRL	7,100			LF	\$40	\$284,000	
Aircraft storage expansion			156	EA	\$30,000	\$5,616,000	
Subtotal						\$5,900,000	
Engineering & Contingency 20%						\$1,180,000	
Total						\$7,080,000	

Appendix C
Maximized Airport Development Alternative (2025 Costs)

Airport	Length	Width	Area	Unit	Unit Price	Scenario 1 Total	Scenario 2 Total
Memorial							
Runway reconstruction/paving/strengthening upgrade	6,700	100	74,444	SY	\$45	\$3,350,000	
MIRL/HIRL	6,700			LF	\$40	\$268,000	
Parallel taxiway construction	6,700	50	37,222	SY	\$30	\$1,116,667	
MITL/HITL	7,300			LF	\$35	\$255,500	
Improved approach capability - PAPI			2	EA	\$37,500	\$75,000	
Develop non-precision approach capability			1	LS	\$250,000	\$250,000	
Aircraft storage expansion			11	EA	\$30,000	\$330,000	
Subtotal						\$5,645,167	
Engineering & Contingency 20%						\$1,129,033	
Total						\$6,774,200	
Mesa Falcon Field							
Exit taxiway construction	600	40	2,667	SY	\$30	\$80,000	
MITL/HITL	600			LF	\$35	\$21,000	
Precision approach capability - MALS	FAA			LS			
Aircraft storage expansion			663	EA	\$30,000	\$19,890,000	
Subtotal						\$19,991,000	
Engineering & Contingency 20%						\$3,998,200	
Total						\$23,989,200	
Phoenix-Deer Valley							
Third parallel runway construction	5,000	100	55,556	SY	\$35	\$1,944,400	
MIRL/HIRL	5,000			LF	\$40	\$200,000	
Parallel taxiway construction	5,600	40	24,889	SY	\$35	\$871,100	
MITL/HITL	5,600			LF	\$35	\$196,000	
Precision approach capability - MALS	FAA			LS			
Aircraft storage expansion			878	EA	\$30,000	\$26,340,000	
Subtotal						\$29,551,500	
Engineering & Contingency 20%						\$5,910,300	
Total						\$35,461,800	

Appendix C
Maximized Airport Development Alternative (2025 Costs)

						Scenario 1	Scenario 2
Airport	Length	Width	Area	Unit	Unit Price	Total	Total
Phoenix-Goodyear							
Parallel runway construction	4,200	75	35,000	SY	\$35	\$1,225,000	
MIRL/HIRL	4,200			LF	\$40	\$168,000	
Parallel taxiway construction	5,000	40	22,222	SY	\$35	\$777,800	
MITL/HITL	5,000			LF	\$35	\$175,000	
Precision approach capability - MALS	FAA			LS			
Aircraft storage expansion			377	EA	\$30,000	\$11,310,000	
Subtotal						\$13,655,800	
Engineering & Contingency 20%						\$2,731,200	
Total						\$16,387,000	
Phoenix-Sky Harbor International							
Scenario 1						Scenario 2	
Fourth parallel runway construction and runway extension 1/	11,000	150	183,333	SY	\$2,250	\$412,500,000	
MIRL/HIRL	11,000			LF	\$125	\$1,375,000	
Runway extension	1,700	150	28,333	SY	\$1,000	\$28,333,333	
MIRL/HIRL	1,700			LF	\$125	\$212,500	
Parallel & exit taxiway construction	13,400	75	111,667	SY	\$1,000	\$111,666,667	
MITL/HITL	13,400			LF	\$45	\$603,000	
Precision approach capability - MALS	FAA			LS			
Terminal building expansion							
Scenario 1			2,500,000	SF	\$275	\$687,500,000	
Scenario 2			3,900,000	SF	\$275	\$1,072,500,000	
Vehicular parking expansion							
Scenario 1			5,600	Spaces	\$6,500	\$36,400,000	
Scenario 2			12,100	Spaces	\$6,500	\$78,650,000	
Miscellaneous (environmental, access, studies, mitigation)				LS		\$125,000,000	
Subtotal						\$1,403,590,500	\$1,830,840,500
Engineering & Contingency 20%						\$280,718,100	\$366,168,100
Total						\$1,684,308,600	\$2,197,008,600

Appendix C
Maximized Airport Development Alternative (2025 Costs)

Airport	Length	Width	Area	Unit	Unit Price	Scenario 1 Total	Scenario 2 Total
Pleasant Valley							
Runway construction/paving	3,800	60	25,333	SY	\$30	\$760,000	
MIRL/HIRL	3,800			LF	\$40	\$152,000	
Parallel taxiway construction	4,475	25	12,431	SY	\$30	\$134,300	
MITL/HITL	4,475			LF	\$35	\$156,600	
PAPI			2	EA	\$37,500	\$75,000	
REIL			2	EA	\$20,000	\$40,000	
Develop non-precision approach capability			1	LS	\$250,000	\$250,000	
Aircraft storage expansion			71	EA	\$30,000	\$2,130,000	
Subtotal						\$3,697,900	
Engineering & Contingency 20%						\$74,000	
Total						\$3,771,900	
Scottsdale							
Precision approach capability - MALS	FAA			LS			
Terminal building construction	20,500			SF	\$275	\$5,637,500	
Aircraft storage expansion			48	EA	\$30,000	\$1,440,000	
Subtotal						\$7,077,500	
Engineering & Contingency 20%						\$1,415,500	
Total						\$8,493,000	
Sky Ranch Carefree							
Runway widening	4,437	10	4,930	SY	\$30	\$147,900	
Install PAPI			2	EA	\$37,500	\$75,000	
Aircraft storage expansion			146	EA	\$30,000	\$4,380,000	
Subtotal						\$4,602,900	
Engineering & Contingency 20%						\$920,600	
Total						\$5,523,500	

Appendix C
Maximized Airport Development Alternative (2025 Costs)

Airport	Length	Width	Area	Unit	Unit Price	Scenario 1 Total	Scenario 2 Total
Stellar							
Aircraft storage expansion			139	EA	\$30,000	\$4,170,000	
Subtotal						\$4,170,000	
Engineering & Contingency 20%						\$834,000	
Total						\$5,004,000	
Wickenburg Municipal							
Develop non-precision approach capability			1	LS	\$500,000	\$500,000	
Aircraft storage expansion			29	EA	\$30,000	\$870,000	
Subtotal						\$1,370,000	
Engineering & Contingency 20%						\$274,000	
Total						\$1,644,000	
Williams Gateway							
Parallel runway development	12,000	150	200,000	SY	\$1,000	\$200,000,000	
HIRL	12,000			LF	\$125	\$1,500,000	
Parallel and exit taxiway construction	13,600	75	113,333	SY	\$1,000	\$13,600,000	
MITL/HITL	13,600			LF	\$35	\$476,000	
Runway 12L-30R extension	3,200	150	53,333	SY	\$1,000	\$53,333,300	
HIRL	12,500			LF	\$125	\$1,562,500	
Parallel and exit taxiway construction	4,800	75	40,000	SY	\$1,000	\$4,800,000	
MITL/HITL	4,800			LF	\$35	\$168,000	
Construct ALS	FAA			LS			
Terminal building construction	578,400			SF	\$275	\$159,060,000	
Aircraft storage expansion			238	EA	\$30,000	\$7,140,000	
Miscellaneous						\$75,000,000	
Subtotal						\$301,063,800	
Engineering & Contingency 20%						\$60,212,800	
Total						\$361,276,600	
MAG Total						\$2,186,943,300	\$2,699,643,300

1/ Includes an estimate for land acquisition and relocation.

Sources: Arizona Department of Transportation Aeronautics Division Five-Year Airport Development Program FY 2003-2007, Wilbur Smith Associates

Appendix C
New Airport Development Alternative (2025 Costs)

Airport	Length	Width	Area	Unit	Unit Price	Total
New General Aviation Airport						
Land Acquisition			750	Acre	\$25,000	\$18,750,000
Runway No. 1 - Paving	6,000	100	66,667	SY	\$30	\$2,000,000
Runway No. 1 - MIRL/HIRL	6,000			LF	\$40	\$240,000
Runway No. 1 - Parallel Taxiway	8,000	35	31,111	SY	\$30	\$933,333
Runway No. 1 - MITL/HITL	8,000	NA	NA	LF	\$35	\$280,000
PAPIs			2	EA	\$37,500	\$75,000
REILs			2	EA	\$20,000	\$40,000
Precision approach capability - MALS	FAA			LS		
Miscellaneous (Fuel, FBO, Parking, Admin., etc.)				LS	\$2,500,000	\$2,500,000
Access				LS	\$5,000,000	\$5,000,000
Utilities				LS	\$1,000,000	\$1,000,000
Aircraft storage	NA	NA	250	EA	\$71,500	\$21,450,000
Subtotal						\$52,268,333
Engineering & Contingency 20%						\$10,453,667
Total						\$62,722,000

Appendix C
New Airport Development Alternative (2025 Costs)

Airport	Length	Width	Area	Unit	Unit Price	Total
New Commercial Service Airport						
Land Acquisition			3,500	Acre	\$25,000	\$87,500,000
Parallel Runway "A" construction	9,000	100	100,000	SY	\$250	\$25,000,000
HIRL	9,000			LF	\$125	\$1,125,000
Runway "A" Parallel & exit taxiway construction	11,000	50	61,111	SY	\$250	\$15,277,778
HITL	11,000			LF	\$75	\$825,000
VASIs			2	EA	\$37,500	\$75,000.00
REILs			2	EA	\$20,000	\$40,000.00
Precision approach capability - MALS	FAA			LS		
Terminal building construction			2,500,000	SF	\$275	\$687,500,000
Vehicular parking expansion			5,600	Spaces	\$6,500	\$36,400,000
Access				LS		\$65,000,000
Miscellaneous (Fuel, FBO, ARFF, Admin., etc.)				LS		\$75,000,000
Subtotal						\$993,742,778
Engineering & Contingency 20%						\$198,748,556
Total						\$1,192,491,333

Sources: Arizona Department of Transportation Aeronautics Division Five-Year Airport Development Program FY 2003-2007, Wilbur Smith Associates